UNITED STATES PATENT APPLICATION

of

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for

PARTIALLY STABILIZED EXERCISE DEVICE

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PARTIALLY STABILIZED EXERCISE DEVICE

BACKGROUND OF THE INVENTION

1. The Field of the Invention

[001] The present invention relates generally to exercise equipment. More specifically, embodiments of the present invention relate to exercise devices, such as stability balls, that enhance the users exercise by destabilizing the user.

2. The Related Technology

[002] Over the years those engaging in physical fitness exercises have used a variety of different ways to achieve their desired exercise goals. For example, individuals exercise by carrying out routines using their own weight for resistance, such as push-ups and sit-ups. To meet their exercise needs, exercisers have also used hand weights and/or devices that use a system of cables, pulleys, weights, springs, and/or resilient bars.

[003] Recently, however, those engaging in physical fitness activities have recognized the value of exercise devices that place the user in an unstable position. One such device is a stability ball, also known as an exercise ball or Swiss ball.

[004] The stability ball is a large flexible ball that is used to create instability during an exercise routine. As the unstable user exercises, he or she exercises his or her core muscles to maintain balance during the exercise routine. For instance an exercise can lie on the stability ball while exercising with hand weights. The instability of the ball requires the user to flex and exert core body muscles to maintain balance while

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performing the hand weight exercise. Instead of simply exercising a targeted group of muscles, the exerciser on a stability ball also uses core or stabilizing muscles, particularly those in the abdominal region. Stability balls are known to develop balance and stability by exercising the core body muscles.

[005] One problem with stability balls, however, is that stability balls have a tendency to move or roll relative to an underlying support surface. While it is desirable for the stability ball to create instability in an exerciser, it is undesirable for the stability ball to randomly move or roll relative to the support surface. For example, a stability ball that is instable with respect to the support surface tends to roll out of position unless the user is continuously in contact with it. A user can become occupied with maintaining the position of the ball, thus detracting from the core body training experience.

[006] Such instability can be particularly inconvenient during an exercise routine incorporating a large stationary exercise device such as a cable exercise device. Since the cable device or other exercise device cannot be easily repositioned, the stability ball must remain in position while the exerciser positions himself or herself with respect to the cable device. With existing stability balls, however, the ball rolls out of position before the user can engage the cable device and position himself or herself on the ball.

[007] Others have solved the instability problem associated with stability balls by adding a base to it. A base limits rolling of the ball, however, it may prevent an exerciser from using the ball as a free ball. Many important core body exercises require the stability ball to roll in at least one direction. Also, in some instances, a stability ball with a base is too heavy to perform the desired exercise.

[008] Furthermore, stabilizing the stability ball using a base dramatically increases the manufacturing costs. Typically, a different exerciser may desire an exercise ball having

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different sizes. Therefore, it is important that individual stability balls be relatively low in cost such that a gym or individual users can afford multiple units.

[009] Therefore, what is needed is a low cost solution for stabilizing a stability ball with respect to a support surface, without compromising the benefits that the stability ball provides to its users.

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BRIEF SUMMARY OF THE INVENTION

[010] Embodiments of the present invention overcome the aforementioned problems by providing an exercise device, such as a stability ball, that is stabilized with respect to the support surface. In an exemplary embodiment, the partially stabilized exercise device includes a flexible, inflatable bladder. Upon inflation, the bladder forms a ball or similar shaped device. The ball has a diameter greater than 15cm and its thickness and surface are configured to support the weight of a user exercising thereon.

[011] A loose filler is disposed within the ball. The filler is selected to move when the ball is moved. For example, the filler can flow on the inner surface of the ball in the event that the ball is moved, such as when the ball is rolled along a floor.

[012] The weight of the filler is selected according to the size of the ball and the desired stability. Generally the more voluminous the ball the more filler that can be utilized to stabilize the exercise device with respect to the support surface. In one embodiment, the ratio of the weight of the filler to the diameter of the ball is in a range from about 3.5 grams / cm to about 35 grams / cm. In another embodiment, the ratio is in the range from about 10 grams / cm to about 25 grams / cm. In yet another embodiment, the ratio is about 15 grams/ cm to about 20. In another embodiment, the amount of filler is related to the volume of the inflated bladder. For example, in one embodiment the ratio of the weight of the filler to the volume of the ball is in a range from about 2 grams/ liter to about 26 grams/ liter. In another embodiment, the ratio is from about 6 grams/ liter to about 20 grams/ liter. In yet another embodiment, the ratio is from about 10 grams/ liter to about 16 grams/ liter.

[013] The filler is selected to flow on the interior surface of the ball. The amount of filler in the ball is relatively small such that it forms a small pile or layer at the bottom

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of the ball. This small amount of weight, however, is effective for minimizing movement of the ball on a flat surface. The amount of filler utilized is sufficiently small that it does not appreciably affect the instability that a user experiences when exercising or balancing on the ball.

[014] The improved exercise ball of the present invention advantageously provides a stability ball that is instable with respect to a user but stabilized with respect to a surface. The stability of the ball with respect to the surface allows a user to place the stability ball at a desired location without the ball moving or rolling away. This feature frees the user to attend to other devices and/or matters without needing to prevent movement or rolling of the ball.

[015] In one embodiment, the stability ball of the present invention has a small amount of filler so that the overall operability of the ball during exercises is largely unchanged, while the movement of the ball is minimized when the ball is not in use. The forces exerted by the user on the ball are much greater than the resistance to rotation created by the filler. Consequently, the user's stability on the ball and exercise benefits provided by the ball are essentially unaffected by the filler. As such users of the stability ball of the present invention can perform all the beneficial exercises associated with other stability balls.

[016] These and other features of the present invention will become more fully apparent from the following description and appended claims.

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BRIEF DESCRIPTION OF THE DRAWINGS

[017] To further clarify the above and other advantages and features of the present invention, a more particular description of the invention will be rendered by reference to specific embodiments thereof, which are illustrated in the appended drawings. It is appreciated that these drawings depict only typical embodiments of the invention and are therefore not to be considered limiting of its scope. The invention will be described and explained with additional specificity and detail through the use of the accompanying drawings in which:

[018] Figure 1 illustrates a perspective view of an exemplary exercise device of the present invention;

[019] Figure 2 shows a cross-section elevational view of the exercise device of Figure 1;

[020] Figure 3A shows a cross-section elevational view of the exercise device of Figure 1, prior to movement of the ball;

[021] Figure 3B shows a cross-section elevational view of the exercise device of Figure 3A, undergoing movement;

[022] Figure 3C shows a cross-section elevational view of the exercise device of Figure 3A, after the exercise device has undergone movment and come to rest;

[023] Figure 4A shows a perspective view of the exercise device of Figure 1 having a translucent bladder;

[024] Figure 4B shows a perspective view of the exercise device of Figure 4A in a larger size and having more filler therein;

[025] Figure 4C shows a perspective view of the exercise device of Figure 4B in a larger size and having more filler therein;

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[026] Figure 5 shows an exerciser performing sit-ups on the exercise device of Figure 1; and

[027] Figure 6 shows an exerciser using a cable exercise device while sitting on the exercise device of Figure 1.

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DETAILED DESCRIPTION OF EXEMPLARY EMBODIMENTS

[028] The present invention relates generally to a partially stabilized exercise device. In one embodiment, the exercise device is stabilized with respect to a support surface. By being stabilized with respect to the support surface, rolling, rotation along the support surface, or other movement of the ball is minimized. Such movements can be referred to as rotation along a surface and should not be considered as limiting as to the type or nature of movement of the bladder. For simplicity, the exercise device will be referred to as a stability ball. The term stability ball is used to generally describe the exercise devices that relate to the present invention and can be used to refer to a variety of types and configurations of balls including exercise ball, Swiss Ball, physioball, fitness ball, yoga ball, Pilates Ball, etc. Furthermore, those skilled in the art typically refer to the size of a stability ball by its diameter as measured in centimeters. For ease of understanding, the disclosure herein follows this convention of measuring stability balls by their diameter in centimeters.

[029] Various ratios disclosed herein are calculated based on the diameter, volume, or other parameter of a bladder inflated to its normal operating pressures. The size of the bladder inflated to normal operating pressures can be substantially similar to the size of the bladder at the point where the bladder has sufficient air pressure such that it does not significantly deflected under its own weight.

[030] Calculations made herein also assume that the inflated bladder has a spherical shape. This convention is used for the ease of describing the invention and is in no way a limitation on the shape of the invention. Those skilled in the art will recognize that the diameter of a sphere is easily converted to and from volume by the equation $4/3\pi r^3$. Where size of a non-spherical bladder is relevant, the diameter of that bladder should be

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determined by taking the volume of the non-spherical bladder and calculating its diameter as if it where a sphere.

[031] With reference now to Figures 1 and 2, a stability ball 10 has an inflatable bladder 12 that defines a chamber. Bladder 12 is inflated and deflated through valve 14. Stability ball 10 also includes a small amount of filler 16 disposed within bladder 12.

[032] Bladder 12 is inflated with air by passing a needle through valve 14 and pumping air into the interior chamber. The amount of air pressure in the bladder can vary according to personal preferences. The air pressure should be sufficient to support the weight of the user thereon. A user's weight is sufficiently supported by bladder 12 so long as when the user is position thereon. Bladder 12 does not flex so far that the user's weight is directly supported by the underlying support surface.

[033] Further reference herein to bladder 12 assumes that bladder 12 is inflated. In addition, while bladder 12 has been described as having air therein, it should be understood that bladder 12 can be inflated with other gases or low density substances.

[034] Bladder 12 sufficiently large enough for a user to perform exercises utilizing bladder 12. In one embodiment the diameter of the ball is in the range of about 15 cm to about 115 cm, e.g. about 23 cm to about 105 cm. Typically, bladder 12 is utilized by a user by performing exercises thereon.

[035] Examples of useful sizes of bladders include spherical bladders with diameters of 23cm, 35cm, 45cm, 55cm, 65cm, 75cm, 85cm, 95cm, and 105cm. Typically, for an adult the bladder is about 55cm to about 75cm in diameter. Youth sizes can typically begin at about 35cm in diameter.

[036] The stability ball of the present invention can also have a non-spherical shape. Non-spherical shapes include various shapes such as elliptical, egg-shaped, and bi-

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lobed. Stability ball 10 can be any shape that has some degree of curvature such that a user will be destabilized when positioned thereon. The curvature also causes instability of the ball with respect to the support surface.

[037] To keep the weight of stability ball 10 at a minimum, bladder 12 is made from a thin, lightweight and sturdy material such as polyvinyl chloride. In one embodiment, bladder 12 is formed from a burst resistant material such as a material comprising primarily polyvinyl chloride in combination with other materials, compounds, or the like. Generally the lighter and stronger the material, the more suitable the material is for forming bladder 12. To be suitable for exercising thereon, bladder 12 resists bursting under pressures exerted by a user thereon. Example burst weights include weights from 200 to 1000 lbs. The texture, flex, and cost of the bladder material parameters can be selected to allow for such weights and pressures. In one embodiment, the outside surface of the ball is grip texturized. Those skilled in the art will recognize that bladder 12 can be formed from any one of a number of materials.

[038] Filler 16 is deposited within bladder 12 by way of valve 14. Filler 16 is a particulate or other dense material that can flow on the inner surface 18 of bladder 12. Suitable fillers include sand, weighted beads, gel, water, and the like. Filler 16 forms a small pile or layer on the bottom of inner surface 18. The small amount of filler 16 is sufficient to weight stability ball 10 and provide a small amount of resistance against rolling.

[039] The amount of filler utilized with respect to the overall volume of the bladder can be selected to provided desired results. In one embodiment, the volume of the filler is less than about 75 percent of the overall volume of the bladder. In another embodiment, the volume of the filler is less than about 50 percent of the overall volume

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of the bladder. In another embodiment, the volume of the filler is less than about 25 percent of the overall volume of the bladder. In another embodiment, the volume of the filler is less than about 10 percent of the overall volume of the bladder. In another embodiment, the volume of the filler is less than about 5 percent of the overall volume of the bladder. In another embodiment, the volume of the filler is less than about 1 percent of the overall volume of the bladder. In one embodiment, the volume of the filler is approximately 0.5 percent of the overall volume of the bladder. In one embodiment, the volume of filler relative to the overall volume of the bladder is dependent on the type of filler utilized. For example, in one embodiment in which the filler comprises sand the volume of the filler is approximately 0.5 percent of the overall volume of the bladder.

[040] A variety of types and configurations of methods and apparatuses can be utilized to introduce filler 16 into bladder 12. For example, in one embodiment, a funnel is utilized alone or in combination with a cylindrical member inserted into, or through valve 14. Filler is deposited into the funnel providing a conduit for the bladder from the exterior of bladder 12 into the interior of bladder 12. In another embodiment, an injection system is utilized to introduce the filler into the interior of the bladder. In yet another embodiment, an automated mechanism is utilized to introduce the filler into the interior of the bladder.

[041] Figures 3A-3B show the rotation of an exemplary stability ball 10 with filler disposed therein. As shown in Figure 3A, initially stability ball 10 is at rest and filler 16 is disposed in the bottom thereof. As shown in Figure 3B, as stability ball 12 begins to roll along a support surface, the friction between inner surface 18 and filler 16 causes filler 16 to move with bladder 12. The weight of filler 16, applied to inner surface 18

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through friction, causes stability ball 18 to resist rotation. In order for stability ball 10 to roll, the rotational force applied to ball 10 must be greater than the rotational resistance created by filler 16. By resisting rotation of the ball, unexpected movement of the ball is minimized providing predictability of the location of the ball. This allows users to exercise in the vicinity of the ball while enjoying a safe periphery around the ball. This can be advantageous in certain circumstances in which the stability balls are utilized. For example, in aerobics or cross-training routines in which the ball is intermittently utilized and/or where exercisers are moving in the proximity of the ball.

[042] As shown in Figure 3B, if a sufficiently large rotational force is applied to stability ball 10, ball 10 will roll, despite the presence of filler 16. Filler 16 is a particulate such as sand or other material that can flow on inner surface 18. Since filler 16 is loose, gravity causes filler 16 to flow toward the bottommost portion of bladder 12.

[043] As shown in Figure 3C, once stability ball 10 has come to rest, filler 16 is again positioned at the bottom of bladder 12. While Figures 3A-3C show filler 16 flowing directly on the inner surface of a single layered bladder, it should be understood, that bladder 12 can have multiple layers.

[044] In one embodiment, the amount of filler 16 is selected to have as little weight as possible and still prevent unwanted ball movement. Existing stability balls are subject to unwanted movement for a variety of reasons including manufacturing imperfections in the ball, imperfections in the floor or support surface, and air currents in the exercise room. The amount of filler in stability ball 10 only needs to produce enough resistance against rotation to overcome the slight forces that cause unwanted movements. Because

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the forces that cause unwanted rotation are generally relatively small, stability ball 10 generally requires only small amounts of filler.

[045] Figures 4A-4C show stability ball 10 in progressively larger sizes. In one embodiment, the weight of the filler utilized is in the range of about 28 grams to about 6.8 kilograms. In one embodiment, the weight of the filler is in the range of about 28 grams of a pound to about 4.55 kilograms. In another embodiment, the weight of the filler is in the range of about 681 grams to about 1.36 kilograms. In yet another embodiment, the weight of the filler is dependent on the type of filler utilized. By way of example, in one embodiment a 23 cm diameter ball has a filler weight of about 113 grams. In another example, a 65-75 cm diameter ball has a filler weight of about 1.13 kilograms.

[046] Filler 16a-16c disposed in the respective balls of Figures 4A-4C increase in weight as the ball size increases. In one embodiment, the amount of weight of the filler utilized is dependent on the size of the bladder. In an exemplary embodiment, the weight of filler 16 disposed in bladder 12 increases with diameter by about 3.5 grams/ cm to about 35 grams/ cm. In another embodiment, the weight to diameter ratio is in the range of about 10 grams/ cm to about 25 grams / cm. In another embodiment, the weight to diameter ratio is from about 15 grams/ cm to about 20 grams/ cm.

[047] In another embodiment, the amount of filler is related to the volume of the inflated bladder. For example, in one embodiment the ratio of the weight of the filler to the volume of the ball is in a range from about 2 grams/ liter to about 26 grams/ liter. In another embodiment, the ratio is from about 6 grams/ liter to about 20 grams/ liter. In yet another embodiment, the ratio is from about 10 grams/ liter to about 16 grams/ liter.

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[048] The amount of filler 16 disposed in bladder 12 can depend on the users' preferences. Thus, a number of stability balls having the same diameter can have different weights. In yet another, the amount of filler is calculated based on another parameter of the bladder. Examples of other parameters can include the weight of the ball, the type of material utilized, the thickness of the material, the type of filler utilized, or the like.

[049] In one embodiment of the invention, filler 16 is colored and bladder 12 is translucent such that the color of filler 16 can be detected. The color of filler 16 corresponds to the weight of the filler such that a user can readily identify a particular stability ball among a selection of stability balls. The color of filler 16 can also correspond to the size of bladder 12 such that a user can readily identify a particular sized stability ball. In another embodiment, the color of the filler 16 is selected to correspond to the color of a semi-translucent and colored ball. In yet another embodiment, glitter is utilized alone or in combination with another filler. In yet still another embodiment, indicia are utilized with the balls to indicate the weight of the exercise ball or other parameter of the ball. This can be useful where stability balls of different weights are utlilized for resistance during an exercise routine.

[050] The stability ball of the present invention can be used for numerous activities including all activities performed by a conventional stability ball. Figure 5 illustrates a user performing sit-ups using stability ball 10 of the present invention. As the user prepares to perform a given exercise the stability ball remains in position on the support surface. If the user has his or her hands occupied with hand weights for example, the user need not worry about controlling stability ball 10 prior to positioning himself or herself thereon.

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[051] Once positioned on stability ball 10, the user performs exercises to develop core muscles involved in stabilizing the user's body. The forces of the user's body on stability ball 10 are so much greater than the resistance provided against rotation provided by filler 16 that the user is substantially unaffected by filler 16 disposed within bladder 12. Thus, as the user performs exercise stability ball 10 can roll or move according to the curvature of bladder 12 so long as the rotation is due to the influence of the user.

[052] Figure 6 illustrates the advantages of stability ball 10 of the present invention when used in combination with a cable exercise device 20. The user positions stability ball 10 and then grasps handles 22a and 22b. While the user grasps handles 22a and 22b, stability ball 10 remains in position due to the presence of filler 16 disposed therein. The user positions himself or herself on stability ball 10 and uses core muscles to stabilize himself or herself as he or she pulls on handles 22a and 22b.

[053] A variety of types and configurations of exercises can be utilized with stability balls of the present invention. For example, a stability ball having a diameter of 23 cm can be placed between the legs of the exerciser to perform certain stability and other types of exercises. The filler minimizes movement of the stability ball when the user places the ball on a support surface during rest or at the completion of the exercise routine.

[054] The present invention can be embodied in other specific forms without departing from its spirit or essential characteristics. The described embodiments are to be considered in all respects only as illustrative and not restrictive. The scope of the invention is, therefore, indicated by the appended claims rather than by the foregoing

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description. All changes which come within the meaning and range of equivalency of the claims are to be embraced within their scope.

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